



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/973,858	10/10/2001	Yuzuru Suzuki	SZI 2 0017	7122

7590 03/01/2004

Jay F. Moldovanyi, Esq.
Fay, Sharpe, Fagan, Minnich & McKee, LLP
7th Floor
1100 Superior Avenue
Cleveland, OH 44114-2518

EXAMINER

JONES, JUDSON

ART UNIT PAPER NUMBER

2834

DATE MAILED: 03/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/973,858

Applicant(s)

SUZUKI ET AL.

Examiner

Judson H. Jones

Art Unit

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-10 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 5-9 is/are rejected.
- 7) ☒ Claim(s) 4 and 10 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Applicant's arguments filed 1/8/2004 have been fully considered but they are not persuasive. The argument that Doe does not suggest molding a separate conversion means into an inner periphery of the rotor is not accepted because Doi et al. column 5 lines 60-63 states, "The through hole 12 may be formed as a metallic buried member embedded in rotor 4 during the formation of the molded-resin rotor 4." Also the claim does not specify that the female screw portion has to be made from a different material from the rest of the resin molded rotor. It only states the conversion means has to be insert molded. The claim states that the "conversion material is made of a material having a small friction coefficient and sufficient abrasion resistance." Making the entire rotor from a material having a small friction coefficient and sufficient abrasion resistance would satisfy the limitations of claim 1, if the conversion means was insert molded. It is also noted that the terms small friction coefficient and sufficient abrasion resistance are not precise limitations. In regard to the combination of Shiga et al. and Doi et al., the examiner is not suggesting a combination of the elements of Shiga et al. and Doi et al. Shiga et al. is used for teaching that the magnets in the Doi et al. rotor may be insert molded. In regard to claim 2, the teaching of Avinger that rounding corners reduces stress concentrations is viewed as being applicable to any corner in a molded element. While Applicant is claiming rounded corners in an element embedded in a molded material, the rounded corners of the element produce rounded corners of the molded material. In effect, the embedded element acts as a part of the mold to produce a molded element having a particular shape.

Claim Objections

Art Unit: 2834

Claim 1 is objected to because of the following informalities: the phrase "an outer periphery of a resin portion made of a resin material" makes no sense. The previous version of claim 1 recites "a rotor unit made of a resin material." If the phrase "made of a resin material" in the present claim refers back to the rotor, then this needs to be made clear by repositioning the claim in the sentence or adding something like __the rotor being__ made of a resin material. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doi et al. 6,144,120 B1 (of record) in view of Shiga et al. 6,286,804 B1 (of record). Doi et al. describes a linear actuator having a stator unit with a coil 3a, a yoke 3c, a molded resin rotor with magnets 4a and a conversion means insert molded in the rotor as described in column 5 lines 47-62. Doi et al. does not disclose how the magnets are placed in the rotor or whether the stator yoke has pole teeth. Shiga et al. discloses a stator having teeth in figure 3 and describes insert molding magnets in a resin molded rotor in column 6 lines 30-42. Since Shiga et al. and Doi et al. are from the same field of endeavor it would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized teeth in the stator of Doi et al. in order to make the motor work properly by establishing magnetic fields opposing the magnetic fields of the rotor

Art Unit: 2834

permanent magnets and it also would have been obvious to insert mold the permanent magnets of the rotor in order to fix the magnets in the proper location cheaply and easily.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Doi et al. in view of Shiga et al. as applied to claim 1 above, and further in view of Avinger et al. 6,286,804 B1. Doi et al. and Shiga et al. both disclose molded rotors but say nothing about rounded corners. Avinger et al. teaches in column 2 lines 37-40 rounding corners to reduce stresses in molded products. While Avinger et al. is not in the motor art, the relevant art here is making molding products. Since Avinger et al. and Doi et al. as modified by Shiga et al. are from the same field of endeavor it would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized rounded corners in the device of Doi as modified by Shiga et al. in order to reduce stresses in a molded product and thus improve the longevity of the product.

Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doi et al. in view of Shiga et al. as applied to claim 1 above, and further in view of Lemelson 5,456,406 A. Doi et al. discloses the linear actuator with the output shaft and conversion means but does not disclose a hexagon or square shaped nut. Lemelson discloses conventionally shaped nuts in figures 4-6. Since Doi et al. only describes the nut in his device as "a metallic buried member," it would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized an commercially available nut of conventional shape in his device.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Doi et al. in view of Shiga et al. as applied to claim 1 above, and further in view of Biesecker et al. 6,161,443 A. Doi et al. discloses the linear actuator with the output shaft and conversion means but does not disclose a spline nut. Biesecker et al. teaches in his abstract that spline nuts allow a shaft to be

Art Unit: 2834

moveable longitudinally and rotationally. Since Biesecker et al. and Doi et al. as modified by Shiga et al. are from the same field of endeavor it would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized a spline nut in order to make the shaft of the actuator moveable longitudinally and rotationally, thus increasing the usefulness of the device by making it usable for more applications.

Claim 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doi et al. in view of Shiga et al., Benton et al. 4,859,394 A and Shattuck 3,276,852 A. Doi et al. describes a linear actuator having a stator unit with a coil 3a, a yoke 3c, a molded resin rotor with magnets 4a and a conversion means insert molded in the rotor as described in column 5 lines 47-62. Doi et al. does not disclose how the magnets are placed in the rotor or whether the stator yoke has pole teeth. Shiga et al. discloses a stator having teeth in figure 3 and describes insert molding magnets in a resin molded rotor in column 6 lines 30-42. Since Shiga et al. and Doi et al. are from the same field of endeavor it would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized teeth in the stator of Doi et al. in order to make the motor work properly by establishing magnetic fields opposing the magnetic fields of the rotor permanent magnets and it also would have been obvious to insert mold the permanent magnets of the rotor in order to fix the magnets in the proper location cheaply and easily. Doi et al. discloses the rotor body formed of a first resin material but does not disclose a conversion means made of second resin material. In Doi et al. the conversion means is either made of metal or made from the first resin material. Benton et al. teaches making a nut from a plastic material for the purpose of increasing the efficiency of the device by reducing friction as described in column 2 lines 13-17. Shattuck teaches placing plastic parts in a mold and injection molding resin around

Art Unit: 2834

the plastic parts. Since Benton et al. and Doi et al. as modified by Shiga et al. are from the same field of endeavor it would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized a plastic nut in place of the metal nut in a linear actuator in order to reduce friction. Since Shattuck and Doi et al. as modified by Shiga et al. and Benton et al. are from the same field of endeavor it would have been obvious at the time the invention was made for one of ordinary skill in the art to have used injection molding to fix the plastic nut of Benton et al. in place quickly and easily.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Doi et al. as modified by Shiga et al., Benton et al. and Shattuck and further in view of Ineson et al. 6,492,751 B2. Doi et al. as modified by Shiga et al., Benton et al. and Shattuck discloses the linear actuator with the first and second resin material but does not disclose specify the type of resin material to be used. Ineson et al. teaches making a motor part from polybutylene terephthalate in column 3 line 67 to column 4 line 3 and teaches making another motor part with internal threads from polyphenylene sulfide. Since Doi et al. as modified by Shiga et al., Benton et al. and Shattuck does not disclose the type of resin material to be used, it would have been obvious at the time the invention was made for one of ordinary skill in the art to have utilized polybutylene terephthalate to make the non-critical motor parts and to have utilized polyphenylene sulfide for making the motor parts requiring higher strength.

Allowable Subject Matter

Claims 4 and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Art Unit: 2834

The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record does not disclose or teach a linear actuator including magnet stoppers arranged on both ends of a magnet by insert molding means in combination with the other features of claims 4 and 10.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Judson H. Jones whose telephone number is 571-272-2025. The examiner can normally be reached on 8-4:30 M-F.

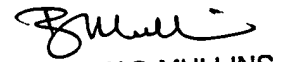
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Burt Mullins can be reached on 571-272-2029. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2834

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



JHJ 2/9/2004



BURTON S. MULLINS
PRIMARY EXAMINER